

Who is dying with HIV/AIDS, and how has this changed over time? Detailed Data Tables and Technical Notes

Recent changes to the presentation of Massachusetts HIV/AIDS surveillance data

Effective January 1, 2011, the Massachusetts Department of Public Health (MDPH), Bureau of Infectious Diseases, HIV/AIDS fact sheets, epidemiologic reports and other HIV data presentations have been updated to remove all HIV/AIDS cases who were first diagnosed in another state before being reported in Massachusetts. As of January 1, 2012, this resulted in the removal of 2,924 HIV/AIDS cases, of which 808 have died and 2,116 were living. These persons living with HIV/AIDS may still continue to reside and receive care in the Commonwealth. The total number of persons living with HIV/AIDS, irrespective of location of diagnosis, is the basis for MDPH service planning. This change is partially a result of increased activities required by the Centers for Disease Control and Prevention (CDC) for de-duplication among states in an effort to identify cases that are counted multiple times in the National HIV/AIDS surveillance system. The cases are assigned to the state that reports the earliest date of AIDS diagnosis if available. If the case has not progressed to AIDS, the case is assigned to the state with the earliest HIV diagnosis date. Please note that all previous HIV/AIDS fact sheets, data reports and presentations include cases that may have been first diagnosed in another state.

Also effective January 1, 2011, the Massachusetts Department of Public Health (MDPH) HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to eliminate the presumed heterosexual exposure mode category for males; those cases have been reassigned to the no identified risk (NIR) exposure mode category. The presumed heterosexual exposure mode category was used with the intention of identifying HIV exposure mode for females when sex with males is the only reported risk factor, there is no evidence of current or past injection drug use (IDU), and behavioral risk and HIV status information about male sexual partners are unknown. Twenty-nine percent of females living with HIV/AIDS and 40% of recent female HIV diagnoses are reported in the presumed heterosexual exposure mode category. The application of the presumed heterosexual exposure mode category to males is overly inclusive in that female to male HIV transmission is biologically less probable, and there are alternate exposure modes that are possible for males, including sex with other men (MSM) or IDU. The CDC reports males diagnosed with HIV/AIDS who report sex with females as their only risk factor, without corresponding partner risk or HIV status information, in the NIR exposure mode category. This revision to report presumed heterosexual male HIV/AIDS cases as NIR will bring Massachusetts HIV/AIDS case reporting for males in alignment with CDC standards. The MDPH will maintain presumed heterosexual and heterosexual exposure mode categories for females.

To describe who is dying with HIV/AIDS and how this has changed over time, these tables and the accompanying fact sheet present a profile of deaths during the ten-year period from 2001–2010 among individuals diagnosed with HIV/AIDS. Additionally, information about deaths among people reported with AIDS for the ten-year period 2000

Detailed Data Tables and Technical Notes: Who is dying with HIV/AIDS, and how has this changed over time?

to 2009, as well as the years 1985, 1990, and 1995 is included for historical perspective. Death data are not available for people reported with HIV infection (non-AIDS) prior to 1999, as HIV infection was not a reportable condition before this time.

Death data presented in this analysis include all deaths among people reported with HIV infection or AIDS in Massachusetts. This includes deaths from non HIV-related causes, such as cardiovascular disease, liver disease, cancer and drug or alcohol abuse. Therefore, the number of deaths reported here will vary from the number of HIV/AIDS deaths reported in *Massachusetts Deaths* by the Massachusetts Department of Public Health, Registry of Vital Records and Statistics, Bureau of Health Information, Statistics, Research and Evaluation.

On an annual basis, the HIV/AIDS Surveillance Program matches all reports of individuals living with HIV/AIDS against that year's vital statistics file of all individuals who died in Massachusetts. Additionally, death certificates with HIV/AIDS among reported underlying conditions are received by the HIV/AIDS Surveillance Program, and providers may report deaths among their patients.

Table 1. Ranking of ten leading underlying causes of death among persons 25–44 years of age: Massachusetts, 2008

Cause	Ranking	N	% of Total Deaths (N=1,906)
Unintentional Injuries	1	482	25.3%
Cancer	2	289	15.2%
Heart Disease	3	244	12.8%
Suicide	4	175	9.2%
Homicide	5	73	3.8%
Ill-defined conditions	6	67	3.5%
Chronic liver disease	7	63	3.3%
HIV/AIDS	8	38	2.0%
Injuries of Undetermined Intent ¹	9	31	1.6%
Diabetes	10	30	1.6%

¹ Deaths where investigation has not determined whether injuries were accidental or purposely inflicted.

Data Source: Bureau of Health Information, Statistics, Research and Evaluation, Massachusetts Deaths 2008, available online at <http://www.mass.gov/eohhs/docs/dph/research-epi/death-report-08.pdf>

Table 2. Deaths among persons reported with HIV infection (non-AIDS) and AIDS by year of death: Massachusetts, 1985–2010¹			
	HIV	AIDS	Total HIV + AIDS
Year of death	N	N	
1985	-- ²	118	-- ²
1986	-- ²	196	-- ²
1987	-- ²	316	-- ²
1988	-- ²	408	-- ²
1989	-- ²	538	-- ²
1990	-- ²	617	-- ²
1991	-- ²	786	-- ²
1992	-- ²	881	-- ²
1993	-- ²	1,008	-- ²
1994	-- ²	1,156	-- ²
1995	-- ²	1,133	-- ²
1996	-- ²	759	-- ²
1997	-- ²	371	-- ²
1998	-- ²	317	-- ²
1999	47	336	383
2000	37	313	350
2001	55	356	411
2002	50	311	361
2003	62	321	383
2004	39	298	337
2005	42	270	312
2006	37	276	313
2007	45	238	283
2008	58	217	275
2009	47	216	263
2010	45	187	232
¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts. ² HIV infection reporting was implemented in 1999; therefore there are no data for deaths among people with HIV that did not progress to AIDS during this time period. Data Source MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), Data as of 1/1/12			

Table 3. Deaths among persons reported with HIV/AIDS by gender and year of death: Massachusetts¹, 2001–2010

Year of death	Male		Female		Total
	N	%	N	%	N
2001	289	70%	122	30%	411
2002	258	71%	103	29%	361
2003	251	66%	132	34%	383
2004	249	74%	88	26%	337
2005	218	70%	94	30%	312
2006	224	72%	89	28%	313
2007	200	71%	83	29%	283
2008	198	72%	77	28%	275
2009	175	67%	88	33%	263
2010	161	69%	71	31%	232

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts.

Data Source MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), Data as of 1/1/12

Table 4. Deaths among persons reported with HIV/AIDS by place of birth and year of death: Massachusetts¹, 2001–2010

Year of Death	US		Puerto Rico/ US Dependency ²		Non-US		Total
	N	%	N	%	N	%	N
2001	322	78%	51	12%	38	9%	411
2002	277	77%	50	14%	34	9%	361
2003	300	78%	50	13%	33	9%	383
2004	253	75%	56	17%	28	8%	337
2005	232	74%	53	17%	27	9%	312
2006	246	79%	41	13%	26	8%	313
2007	228	81%	34	12%	21	7%	283
2008	202	73%	39	14%	34	12%	275
2009	201	76%	35	13%	27	10%	263
2010	181	78%	32	14%	19	8%	232

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, Office of HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being diagnosed and reported in Massachusetts.

² Ninety-five percent of all people diagnosed with HIV infection in MA who were born in a US dependency were born in Puerto Rico, 1% were born in the US Virgin Islands, <1% were born in American Samoa, and 4% were born in an unspecified dependency.

Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), data as of 1/1/12

Table 5. Deaths among persons reported with HIV/AIDS by race/ethnicity and year of death: Massachusetts¹, 2001–2010

Year of Death	White NH		Black NH		Hispanic/Latino		API		Other/Und.		Total
	N	%	N	%	N	%	N	%	N	%	N
2001	218	53%	114	28%	78	19%	-- ²	-- ²	-- ²	-- ²	411
2002	173	48%	103	29%	81	22%	-- ²	-- ²	-- ²	-- ²	361
2003	186	49%	108	28%	86	22%	-- ²	-- ²	-- ²	-- ²	383
2004	169	50%	84	25%	82	24%	-- ²	-- ²	-- ²	-- ²	337
2005	149	48%	82	26%	78	25%	-- ²	-- ²	-- ²	-- ²	312
2006	170	54%	76	24%	65	21%	-- ²	-- ²	-- ²	-- ²	313
2007	146	52%	77	27%	59	21%	-- ²	-- ²	-- ²	-- ²	283
2008	136	49%	74	27%	59	21%	-- ²	-- ²	-- ²	-- ²	275
2009	126	48%	65	25%	66	25%	-- ²	-- ²	-- ²	-- ²	263
2010	108	47%	60	26%	59	25%	-- ²	-- ²	-- ²	-- ²	232

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts.

² Numbers less than 5 for populations of less than 50,000 are suppressed for the assurance of confidentiality.

NH=Non-Hispanic, API=Asian/Pacific Islander, Other/Und. = Other/Undetermined and includes American Indian/Alaska Native and undetermined race/ethnicity

Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), Data as of 1/1/12

Table 6. Deaths among *males* reported with HIV/AIDS by race/ethnicity and year of death: Massachusetts¹, 2001–2010

Year of Death	White NH		Black NH		Hispanic/Latino		API		Other/Und.		Total
	N	%	N	%	N	%	N	%	N	%	N
2001	160	55%	73	25%	55	19%	-- ²	-- ²	-- ²	-- ²	289
2002	134	52%	66	26%	54	21%	-- ²	-- ²	-- ²	-- ²	258
2003	122	49%	66	26%	62	25%	-- ²	-- ²	-- ²	-- ²	251
2004	134	54%	56	22%	57	23%	-- ²	-- ²	-- ²	-- ²	249
2005	109	50%	52	24%	54	25%	-- ²	-- ²	-- ²	-- ²	218
2006	133	59%	45	20%	44	20%	-- ²	-- ²	-- ²	-- ²	224
2007	117	59%	38	19%	44	22%	-- ²	-- ²	-- ²	-- ²	200
2008	106	54%	51	26%	35	18%	-- ²	-- ²	-- ²	-- ²	198
2009	82	47%	45	26%	42	24%	6	3%	0	0%	175
2010	79	49%	38	24%	42	26%	-- ²	-- ²	-- ²	-- ²	161

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts.

² Numbers less than 5 for populations of less than 50,000 are suppressed for the assurance of confidentiality.

NH=Non-Hispanic, API=Asian/Pacific Islander, Other/Und. = Other/Undetermined and includes American Indian/Alaska Native and undetermined race/ethnicity

Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), Data as of 1/1/12

Table 7. Deaths among *females* reported with HIV/AIDS by race/ethnicity and year of death: Massachusetts¹, 2001–2010

	White NH		Black NH		Hispanic/ Latina		API		Other/Und.		Total
Year of Death	N	%	N	%	N	%	N	%	N	%	N
2001	58	48%	41	34%	23	19%	0	0%	0	0%	122
2002	39	38%	37	36%	27	26%	0	0%	0	0%	103
2003	64	48%	42	32%	24	18%	-- ²	-- ²	-- ²	-- ²	132
2004	35	40%	28	32%	25	28%	0	0%	0	0%	88
2005	40	43%	30	32%	24	26%	0	0%	0	0%	94
2006	37	42%	31	35%	21	24%	0	0%	0	0%	89
2007	29	35%	39	47%	15	18%	0	0%	0	0%	83
2008	30	39%	23	30%	24	31%	0	0%	0	0%	77
2009	44	50%	20	23%	24	27%	0	0%	0	0%	88
2010	29	41%	22	31%	17	24%	-- ²	-- ²	-- ²	-- ²	71

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts.

² Numbers less than 5 for populations of less than 50,000 are suppressed for the assurance of confidentiality.

NH=Non-Hispanic, API=Asian/Pacific Islander, Other/Und. = Other/Undetermined and includes American Indian/Alaska Native and undetermined race/ethnicity

Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), Data as of 1/1/12

Table 8. Deaths among persons reported with HIV/AIDS by exposure mode and year of death: Massachusetts¹, 2001–2010

	MSM		IDU		MSM/ IDU		HTSX		Other		Pres. HTSX ²		Undeter- -mined ³		Total
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N
2001	85	21%	210	51%	19	5%	27	7%	5	1%	17	4%	48	12%	411
2002	74	20%	195	54%	15	4%	33	9%	9	2%	10	3%	25	7%	361
2003	66	17%	192	50%	17	4%	46	12%	8	2%	9	2%	45	12%	383
2004	65	19%	169	50%	18	5%	30	9%	7	2%	11	3%	37	11%	337
2005	56	18%	159	51%	15	5%	35	11%	-- ⁴	-- ⁴	-- ⁴	-- ⁴	27	9%	312
2006	63	20%	158	50%	18	6%	28	9%	-- ⁴	-- ⁴	-- ⁴	-- ⁴	27	9%	313
2007	64	23%	124	44%	25	9%	28	10%	6	2%	12	4%	24	8%	283
2008	55	20%	124	45%	15	5%	26	9%	-- ⁴	-- ⁴	-- ⁴	-- ⁴	39	14%	275
2009	39	15%	135	51%	8	3%	29	11%	-- ⁴	-- ⁴	-- ⁴	-- ⁴	36	14%	263
2010	51	22%	111	48%	11	5%	15	6%	-- ⁴	-- ⁴	-- ⁴	-- ⁴	33	14%	232

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts.

² Includes female sex with male of unknown HIV status or risk. This category is limited to females.

³ Includes male sex with female of unknown HIV status or risk, those still being followed up for risk information, those who have died with no determined risk, and those lost to follow-up.

⁴ Numbers less than 5 for populations of less than 50,000 are suppressed for the assurance of confidentiality.

MSM = Male-to-Male Sex; IDU = Injection Drug Use; MSM/IDU = Male-to-Male Sex and Injection Drug Use; HTSX = Heterosexual Sex; Pres. HTSX = Presumed Heterosexual Sex

Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), Data as of 1/1/12

Note: The category of “presumed heterosexual” is used in Massachusetts to re-assign females who are reported with an exposure of heterosexual sex, but only with a partner of unknown HIV status or behavioral risk. Massachusetts uses the category of presumed heterosexual to distinguish these female cases from other undetermined cases about which we know less. Prior to January 1, 2011, the presumed heterosexual category was also used to report HIV data in males. The rationale for the application of the presumed heterosexual exposure mode category to females only has been addressed in the MDPH OHA report “Intersecting Risks: HIV Infection among Heterosexual Women and Men in Massachusetts.” (2010) http://www.mass.gov/Eeohhs2/docs/dph/aids/intersecting_risks.pdf . Nationally, the Centers for Disease Control and Prevention categorize “presumed heterosexual” cases as “no identified risk” (NIR). As such, comparisons of the presumed heterosexual category cannot be made to national data. Caution should be used in interpreting data for presumed heterosexual, as it is still not clear what the exposure risk was for females in this category. Although a person may not report other risk behaviors, such as injection drug use to a health care provider, it does not exclude the possibility that an individual has experienced these other risks. There are many barriers to disclosing HIV risk behaviors in the health care setting such as a limited patient-provider relationship or stigma.

Table 9. Deaths among *males* reported with HIV/AIDS by exposure mode and year of death: Massachusetts¹, 2001–2010

	MSM		IDU		MSM/ IDU		HTSX		Other		Undeter- mined ²		Total N
	N	%	N	%	N	%	N	%	N	%	N	%	
2001	85	29%	129	45%	19	7%	-- ³	-- ³	-- ³	-- ³	45	16%	289
2002	74	29%	130	50%	15	6%	9	3%	6	2%	24	9%	258
2003	66	26%	117	47%	17	7%	-- ³	-- ³	-- ³	-- ³	29	12%	251
2004	65	26%	113	45%	18	7%	16	6%	6	2%	31	12%	249
2005	56	26%	108	50%	15	7%	-- ³	-- ³	-- ³	-- ³	25	11%	218
2006	63	28%	104	46%	18	8%	-- ³	-- ³	-- ³	-- ³	26	12%	224
2007	64	32%	78	39%	25	13%	-- ³	-- ³	-- ³	-- ³	21	11%	200
2008	55	28%	80	40%	15	8%	-- ³	-- ³	-- ³	-- ³	31	16%	198
2009	39	22%	87	50%	8	5%	-- ³	-- ³	-- ³	-- ³	30	17%	175
2010	51	32%	66	41%	11	7%	-- ³	-- ³	-- ³	-- ³	26	16%	161

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts.

² Includes male sex with female of unknown HIV status or risk, those still being followed up for risk information, those who have died with no determined risk, and those lost to follow-up.

³ Numbers less than 5 for populations of less than 50,000 are suppressed for the assurance of confidentiality.

MSM = Male-to-Male Sex; IDU = Injection Drug Use; MSM/IDU = Male-to-Male Sex and Injection Drug Use; HTSX = Heterosexual Sex
Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), Data as of 1/1/12

Table 10. Deaths among *females* reported with HIV/AIDS by exposure mode and year of death: Massachusetts¹, 2001–2010

	IDU		HTSX		Other		Pres. HTSX ²		Undeter-mined ³		Total
	N	%	N	%	N	%	N	%	N	%	N
2001	81	66%	17	14%	-- ⁴	-- ⁴	17	14%	-- ⁴	-- ⁴	122
2002	65	63%	24	23%	-- ⁴	-- ⁴	10	10%	-- ⁴	-- ⁴	103
2003	75	57%	28	21%	-- ⁴	-- ⁴	-- ⁴	-- ⁴	16	12%	132
2004	56	64%	14	16%	-- ⁴	-- ⁴	11	13%	-- ⁴	-- ⁴	88
2005	51	54%	23	24%	-- ⁴	-- ⁴	18	19%	-- ⁴	-- ⁴	94
2006	54	61%	18	20%	-- ⁴	-- ⁴	16	18%	-- ⁴	-- ⁴	89
2007	46	55%	19	23%	-- ⁴	-- ⁴	12	14%	-- ⁴	-- ⁴	83
2008	44	57%	13	17%	0	0%	12	16%	8	10%	77
2009	48	55%	19	22%	0	0%	15	17%	6	7%	88
2010	45	63%	11	15%	-- ⁴	-- ⁴	7	10%	-- ⁴	-- ⁴	71

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts.

² Includes female sex with male of unknown HIV status and risk. This category is limited to females.

³ Includes those still being followed up for risk information, those who have died with no determined risk, and those lost to follow-up.

⁴ Numbers less than 5 for populations of less than 50,000 are suppressed for the assurance of confidentiality.

IDU = Injection Drug Use; HTSX = Heterosexual Sex; Pres. HTSX = Presumed Heterosexual Sex

Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), Data as of 1/1/12

Technical Notes: Explanation of Crude and Age-Adjusted Rates of Death

A rate of a disease per 100,000 population is a more precise way to compare groups that have substantially different population sizes rather than relying on the raw number of deaths. To adjust for fluctuations in the annual rate of death among people reported with HIV/AIDS, an average annual rate of death for the period 2008 to 2010 is used. The average number of deaths is calculated over the three-year period by adding the total number of deaths among people reported with HIV/AIDS in each of the three years and dividing by three. The crude average annual rate of death is then calculated by dividing the average number of people reported with HIV/AIDS who died during the three years by the entire population (everyone or the sub-population involved) and multiplying by 100,000. (See example 1 below). The Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2005 (MMARS05) file is the source of population sizes for these calculations.

Example 1: Calculation of Crude Average Annual Rate of Death among People Reported with HIV/AIDS for White Individuals, Massachusetts, 2008–2010 (2.4 per 100,000)

$$\begin{aligned} \text{Crude average annual rate of} & \\ \text{death among reported} & \\ \text{HIV/AIDS cases for white} & \\ \text{individuals, 2008–2010} & = (((\text{number of white individuals reported with HIV/AIDS} \\ & \text{who died in 2008} + \text{number of white individuals reported} \\ & \text{with HIV/AIDS who died in 2009} + \text{number of white} \\ & \text{individuals reported with HIV/AIDS who died in 2010}) \div 3) \\ & \div \text{population size of white individuals}) \times 100,000 \\ & = (((136 + 126 + 108) \div 3) \div 5,215,472) \times 100,000 \\ & = ((370 \div 3) \div 5,215,472) \times 100,000 \\ & = (123.3333 \div 5,215,472) \times 100,000 \\ & = 0.000023648 \times 100,000 \\ & = \mathbf{2.4} \end{aligned}$$

Sometimes, in addition to the population size being different, the age composition of the populations is different. In Massachusetts, black and Hispanic/Latino populations are younger than white. The median age of black people (29.7 years) and Hispanic/Latino people (24.5 years) is younger than that of white people (38.8 years). Therefore, it is necessary to “age-adjust” the rate of death among people reported with HIV/AIDS to get a true comparison of the impact of the disease across racial/ethnic groups without an effect from the differences in age composition. Age-adjustment of rates minimizes the distortion created by differences in age composition.

Age-adjusted rates are calculated by weighting the age-specific rates for a given population by the age distribution of a standard population. The age-specific rates are calculated for eleven age groups ranging from less than one year old to 85 years or above and are weighted by the 2000 US standard population. The weighted age-

specific rates are then added to produce the adjusted rate for all ages combined. (See example 2 below).

Example 2: Calculation of Age-adjusted Rate of Death among People Reported with HIV/AIDS for White Individuals, Massachusetts, 2008–2010, (2.1 per 100,000)

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>
Age group (in years)	Average number of deaths among reported HIV/AIDS cases 2008–2010	Population (2005)	2000 US standard population weight	Age-adjusted rate $((B \div C \times D) \times 100,000)$
<1	0	57,670	0.013818	0.000000
1-4	0	230,681	0.055317	0.000000
5-14	0	614,485	0.145565	0.000000
15-24	0.33333333	646,026	0.138646	0.007154
25-34	2.33333333	636,970	0.135573	0.049663
35-44	24.66666667	823,238	0.162613	0.487237
45-54	55	818,844	0.134834	0.905651
55-64	33	601,053	0.087247	0.479018
65-74	6	352,672	0.066037	0.112349
75-84	2	299,510	0.044842	0.029944
85+ years	0	134,323	0.015508	0.000000
Total	123.333333	5,215,472	1	2.1

To see the effect of age-distribution on rates of death see Table 11 below for a comparison of crude and age-adjusted rates by race/ethnicity.

Table 11. Crude and age-adjusted rates of death among people reported with HIV/AIDS per 100,000 population¹ by race/ethnicity and gender: average annual rate 2008–2010, Massachusetts²

	Crude Rate per 100,000	Age-Adjusted Rate per 100,000
State Total:		
White (non-Hispanic)	2.4	2.1
Black (non-Hispanic)	17.1	19.5
Hispanic/Latino	12.1	18.0
Mass. Total Rate	4.0	3.7
Males:	Crude Rate per 100,000	Age-Adjusted Rate per 100,000
White (non-Hispanic) Males	3.5	3.1
Black (non-Hispanic) Males	23.7	29.0
Hispanic/Latino Males	15.7	25.7
Mass. Total Rate Among Males	5.7	5.3
Females:	Crude Rate per 100,000	Age-Adjusted Rate per 100,000
White (non-Hispanic) Females	1.3	1.2
Black (non-Hispanic) Females	10.8	11.8
Hispanic/Latina Females	8.6	11.6
Mass. Total Rate Among Females	2.4	2.2

¹ The denominators for rate calculations are from the Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2005; all rates are age-adjusted using the 2000 US standard population.

² Effective, January 1, 2011 the Massachusetts Department of Public Health, Office of HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being diagnosed and reported in Massachusetts.

Data Source: MDPH HIV/AIDS Surveillance Program; data as of 1/1/12

Technical Notes: Trends in survival after an AIDS diagnosis

The following analyses describe changes over time in the survival of people who are diagnosed with AIDS in Massachusetts.

Tables 12–16 describe how many people died within 1 year of an AIDS diagnosis, between 1 and 2 years, between 2 and 3 years, etc., and up to 10 or more years for all people diagnosed with AIDS from 1987 to 2008. For example, the first column of Table 13 indicates that of 628 people diagnosed with AIDS in 1987, 250, or 40%, died within 1 year of diagnosis; 157, or 25%, died between 1 and 2 years of diagnosis; and 90, or 14%, died between 2 and 3 years of diagnosis.

It should be noted that if a person was diagnosed with AIDS in 2008, only one complete year of survival can be assessed, since this report includes data only up to January 1, 2010. Likewise, a diagnosis of AIDS in 2007 would not allow observation for more than two years, etc. These observations are relevant when interpreting the following tables and especially when comparing the distribution of survival times across years. With these caveats in mind, there has been a fairly consistent decline in the percentage of people who die within two years of an AIDS diagnosis. This most likely reflects higher rates of early diagnosis and improved care and treatment of people living with AIDS in the Commonwealth.

In comparing survival for people diagnosed in 1988 with people diagnosed in more recent years, it is evident that the proportion of people who are still alive is greater for each successive time period. More people are surviving for longer time periods after being diagnosed with AIDS. Advances in the prevention of opportunistic infections and the treatment of HIV infection over the years account for this significant increase in survival.

Table 12. Time from AIDS diagnosis to death by year of AIDS diagnosis: Massachusetts¹, 1987–1991

	1987		1988		1989		1990		1991	
Survival time ²	N	%	N	%	N	%	N	%	N	%
<1 yr.	250	40%	256	31%	265	28%	273	26%	340	26%
1 - <2 yr.	157	25%	199	24%	216	23%	207	20%	296	23%
2 - <3 yr.	90	14%	139	17%	165	17%	192	18%	204	16%
3 - <4 yr.	44	7%	69	8%	85	9%	113	11%	114	9%
4 - <5 yr.	16	3%	35	4%	63	7%	63	6%	70	5%
5 - <6 yr.	11	2%	25	3%	44	5%	39	4%	35	3%
6 - <7 yr.	8	1%	12	1%	16	2%	14	1%	12	1%
7 - <8 yr.	5	1%	13	2%	7	1%	10	1%	13	1%
8 - <9 yr.	9	1%	3	<1%	4	<1%	10	1%	10	1%
9 - <10 yr.	0	0%	2	<1%	5	1%	7	1%	6	<1%
10+ yr.	9	1%	18	2%	26	3%	29	3%	40	3%
Still Alive	29	5%	65	8%	63	7%	93	9%	163	13%
Total	628	100%	836	100%	959	100%	1,050	100%	1,303	100%

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, Office of HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being diagnosed and reported in Massachusetts.

² Years between AIDS diagnosis and death

Data Source: MDPH Surveillance Program; data as of 1/1/12

Table 13. Time from AIDS diagnosis to death by year of AIDS diagnosis: Massachusetts¹, 1992–1996

	1992		1993		1994		1995		1996	
Survival time ²	N	%	N	%	N	%	N	%	N	%
<1 yr.	334	20%	325	19%	266	19%	195	15%	97	9%
1 - <2 yr.	359	21%	345	20%	246	17%	95	7%	45	4%
2 - <3 yr.	297	18%	254	15%	116	8%	56	4%	53	5%
3 - <4 yr.	170	10%	110	6%	51	4%	50	4%	40	4%
4 - <5 yr.	59	4%	47	3%	35	2%	40	3%	41	4%
5 - <6 yr.	32	2%	34	2%	40	3%	31	2%	37	3%
6 - <7 yr.	36	2%	32	2%	26	2%	36	3%	34	3%
7 - <8 yr.	15	1%	32	2%	43	3%	44	3%	23	2%
8 - <9 yr.	32	2%	21	1%	25	2%	28	2%	25	2%
9 - <10 yr.	21	1%	22	1%	17	1%	27	2%	17	2%
10+ yr.	80	5%	102	6%	98	7%	90	7%	75	7%
Still Alive	247	15%	380	22%	450	32%	634	48%	641	57%
Total	1,682	100%	1,704	100%	1,413	100%	1,326	100%	1,128	100%

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, Office of HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being diagnosed and reported in Massachusetts.

² Years between AIDS diagnosis and death

Data Source: MDPH Surveillance Program; data as of 1/1/12

Table 14. Time from AIDS diagnosis to death by year of AIDS diagnosis: Massachusetts¹, 1997–2001

	1997		1998		1999		2000		2001	
Survival time ²	N	%	N	%	N	%	N	%	N	%
<1 yr.	67	7%	53	6%	59	7%	55	7%	62	9%
1 - <2 yr.	38	4%	38	4%	31	4%	19	3%	23	3%
2 - <3 yr.	33	4%	19	2%	34	4%	25	3%	21	3%
3 - <4 yr.	28	3%	23	3%	22	3%	19	3%	14	2%
4 - <5 yr.	39	4%	27	3%	26	3%	21	3%	16	2%
5 - <6 yr.	24	3%	26	3%	18	2%	25	3%	19	3%
6 - <7 yr.	23	3%	25	3%	17	2%	12	2%	10	1%
7 - <8 yr.	22	2%	26	3%	18	2%	11	1%	11	2%
8 - <9 yr.	20	2%	18	2%	19	2%	11	1%	7	1%
9 - <10 yr.	20	2%	17	2%	12	1%	12	2%	6	1%
10+ yr.	52	6%	37	4%	18	2%	7	1%	-- ³	-- ³
Still Alive	530	59%	604	66%	601	69%	541	71%	508	73%
Total	896	100%	913	100%	875	100%	758	100%	697	100%

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, Office of HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being diagnosed and reported in Massachusetts.

² Years between AIDS diagnosis and death

³ Individuals diagnosed in this year have not yet had the opportunity to survive this many years before death.

Data Source: MDPH Surveillance Program; data as of 1/1/12

Table 15. Time from AIDS diagnosis to death by year of AIDS diagnosis: Massachusetts¹, 2002–2006

	2002		2003		2004		2005		2006	
Survival time ²	N	%	N	%	N	%	N	%	N	%
<1 yr.	43	6%	39	7%	46	7%	36	5%	31	5%
1 - <2 yr.	19	3%	18	3%	19	3%	10	2%	10	2%
2 - <3 yr.	13	2%	8	1%	15	2%	10	2%	9	1%
3 - <4 yr.	18	3%	13	2%	15	2%	7	1%	4	1%
4 - <5 yr.	13	2%	14	2%	10	1%	13	2%	2	<1%
5 - <6 yr.	11	2%	10	2%	8	1%	9	1%	-- ³	-- ³
6 - <7 yr.	16	2%	12	2%	7	1%	-- ³	-- ³	-- ³	-- ³
7 - <8 yr.	8	1%	2	<1%	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
8 - <9 yr.	3	<1%	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
9 - <10 yr.	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
10+ yr.	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
Still Alive	537	79%	482	81%	547	82%	570	87%	577	91%
Total	681	100%	598	100%	667	100%	655	100%	633	100%

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, Office of HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being diagnosed and reported in Massachusetts.

² Years between AIDS diagnosis and death

³ Individuals diagnosed in this year have not yet had the opportunity to survive this many years before death.

Data Source: MDPH Surveillance Program; data as of 1/1/12

Table 16. Time from AIDS diagnosis to death by year of AIDS diagnosis: Massachusetts¹, 2007–2010

	2007		2008		2009		2010	
Survival time ²	N	%	N	%	N	%	N	%
<1 yr.	24	5%	29	7%	24	6%	18	5%
1 - <2 yr.	18	3%	7	2%	2	<1%	-- ³	-- ³
2 - <3 yr.	8	2%	4	1%	-- ³	-- ³	-- ³	-- ³
3 - <4 yr.	3	1%	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
4 - <5 yr.	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
5 - <6 yr.	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
6 - <7 yr.	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
7 - <8 yr.	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
8 - <9 yr.	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
9 - <10 yr.	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
10+ yr.	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
Still Alive	475	90%	379	90%	401	94%	376	95%
Total	528	100%	419	100%	427	100%	394	100%

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, Office of HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being diagnosed and reported in Massachusetts.

² Years between AIDS diagnosis and death

³ Individuals diagnosed in this year have not yet had the opportunity to survive this many years before death.

Data Source: MDPH Surveillance Program; data as of 1/1/12